Non-Unitary Partition Tables.

By Professor Cayley.

In the theory of Seminvariants we are concerned with the non-unitary partitions of a number, that is, the number of ways of making up the number with the parts 2, 3, 4, . . . ; or what is the same writing, writing $\mathbf{2} = 1 - x^2$, $\mathbf{3} = 1 - x^3$, etc. with the Generating Functions having in their denominators the factors $\mathbf{2}$, $\mathbf{3}$, $\mathbf{4}$, etc. In the present short paper, I give the developments up to x^{100} of the functions $1 \div \mathbf{2}$, $\mathbf{2}\cdot\mathbf{3}$, $\mathbf{2}\cdot\mathbf{3}\cdot\mathbf{4}$, $\mathbf{2}\cdot\mathbf{3}\cdot\mathbf{4}\cdot\mathbf{5}$, $\mathbf{2}\cdot\mathbf{3}\cdot\mathbf{4}\cdot\mathbf{5}\cdot\mathbf{6}$, respectively: and also of the function $x^6 + x^{13} - 2x^{16} - x^{18} + x^{31} \div \mathbf{2}\cdot\mathbf{3}\cdot\mathbf{4}\cdot\mathbf{5}\cdot\mathbf{6}$, which function is (there is strong reason to believe) the G. F. for the number of sextic syzygies of a given weight: the same function without the term x^{31} occurs p. 115 in Professor Sylvester's paper "On Subinvariants, *i. e.* Seminvariants to Binary Quantics of an Unlimited Order," *A. M. J.* t. V (1882), pp. 79–136.

In the tables X is written to denote $x^6 + x^{13} - 2x^{16} - x^{18} + x^{31}$.

Ind. x	$1\div$ 2.3	2.3.4	2.3.4.5	2.3.4.5.6	$X\div$ 2.3.4.5.6	Ind. x	$1\div$ 2.3	2.3.4	2.3.4.5	2.3.4.5.6	$X\div$ 2.3.4.5.6
0	1	1	1	1		50	9	65	258	750	186
1	0	0	0	0		51	9	61	268	783	226
2	1	1	1	1		52	9	70	286	854	203
3	1	1	1	1		53	9	65	297	891	248
4	1	2	2	2		54	10	75	316	972	223
5	1	1	2	2		55	9	70	328	1010	270
6	2	3	3	4	1	56	10	80	348	1098	242
7	1	2	3	3	0	57	10	75	361	1144	294
8	2	4	5	6	1	58	10	85	382	1236	262
9	2	3	5	6	1	59	10	80	396	1287	319
10	2	5	7	9	2	60	11	91	419	1391	284
11	2	4	7	9	2	61	10	85	433	1443	344
12	3	7	10	14	4	62	11	96	457	1555	306
13	2	5	10	13	4	63	11	91	473	1617	371
14	3	8	13	19	6	64	11	102	598	1734	328
15	3	7	14	20	7	65	11	96	515	1802	399
16	3	10	17	26	8	66	12	108	541	1932	353
17	3	8	18	27	11	67	11	102	559	2002	427
18	4	12	22	36	13	68	12	114	587	2142	377
19	3	10	23	36	15	69	12	108	606	2223	457
20	4	14	28	47	17	70	12	120	635	2369	402
21	4	12	29	49	21	71	12	114	655	2457	490
22	4	16	34	60	22	72	13	127	686	2618	429
23	4	14	36	63	28	73	12	120	707	2709	519
24	5	19	42	78	29	74	13	133	739	2881	456
25	4	16	44	80	35	75	13	127	762	2985	552
26	5	21	50	97	36	76	13	140	795	3164	483
27	5	19	53	102	44	77	13	133	819	3276	586
28	5	24	60	120	43	78	14	147	854	3472	513
29	5	21	63	126	54	79	13	140	879	3588	620
30	6	27	71	149	53	80	14	154	916	3797	542
31	5	24	74	154	64	81	14	147	942	3927	656
32	6	30	83	180	62	82	14	161	980	4144	572
33	6	27	87	189	78	83	14	154	1008	4284	693
34	6	33	96	216	72	84	15	169	1048	4520	604
35	6	30	101	227	89	85	14	161	1077	4665	730
36	7	37	111	260	84	86	15	176	1118	4915	636
37	6	33	116	270	102	87	15	169	1149	5076	769
38	7	40	127	307	96	88	15	184	1192	5336	568
39	7	37	133	322	117	89	15	176	1224	5508	809
40	7	44	145	361	108	90	16	192	1269	5789	703
41	7	40	151	378	133	91	15	184	1302	5967	849
42	8	48	164	424	123	92	16	200	1349	6264	736
43	7	44	171	441	149	93	16	192	1384	6460	891
44	8	52	185	492	137	94	16	208	1432	6768	772
45	8	48	193	515	167	95	16	200	1469	6977	934
46	8	56	207	568	152	96	17	217	1519	7308	809
47	8	52	216	594	186	97	16	208	1557	7524	977
48	9	61	232	656	169	98	17	225	1609	7873	846
49	8	56	241	682	205	99	17	217	1649	8109	1022
						100	17	234	1883	8651	883